

## APPENDIX 1:

### Summary of current air quality in London Borough of Richmond upon Thames

The UK Air Quality Strategy (AQS), released in July 2007, provides the overarching strategic framework for air quality management in the UK and contains national air quality standards and objectives established by the Government to protect human health. The AQS objectives take into account EU Directives that set limit values which member states are legally required to achieve by their target dates.

The London Borough of Richmond upon Thames is meeting the national AQS objectives for all pollutants other than for Nitrogen Dioxide (NO<sub>2</sub>) and Particulate Matter (PM). Limited monitoring data for Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>) indicates compliance with the objectives, however pollutant dispersion modelling indicates that levels of PM<sub>10</sub> are likely to be exceeding the annual mean objective at specific locations. As both PM<sub>10</sub> and PM<sub>2.5</sub> are potentially damaging to health at any level, this remains a pollutant of concern.

The modelled NO<sub>2</sub> concentrations clearly identify the contribution of road traffic emissions with exceedance of the NO<sub>2</sub> annual mean objective closely correlated with the main transit routes and busy junctions within the borough.

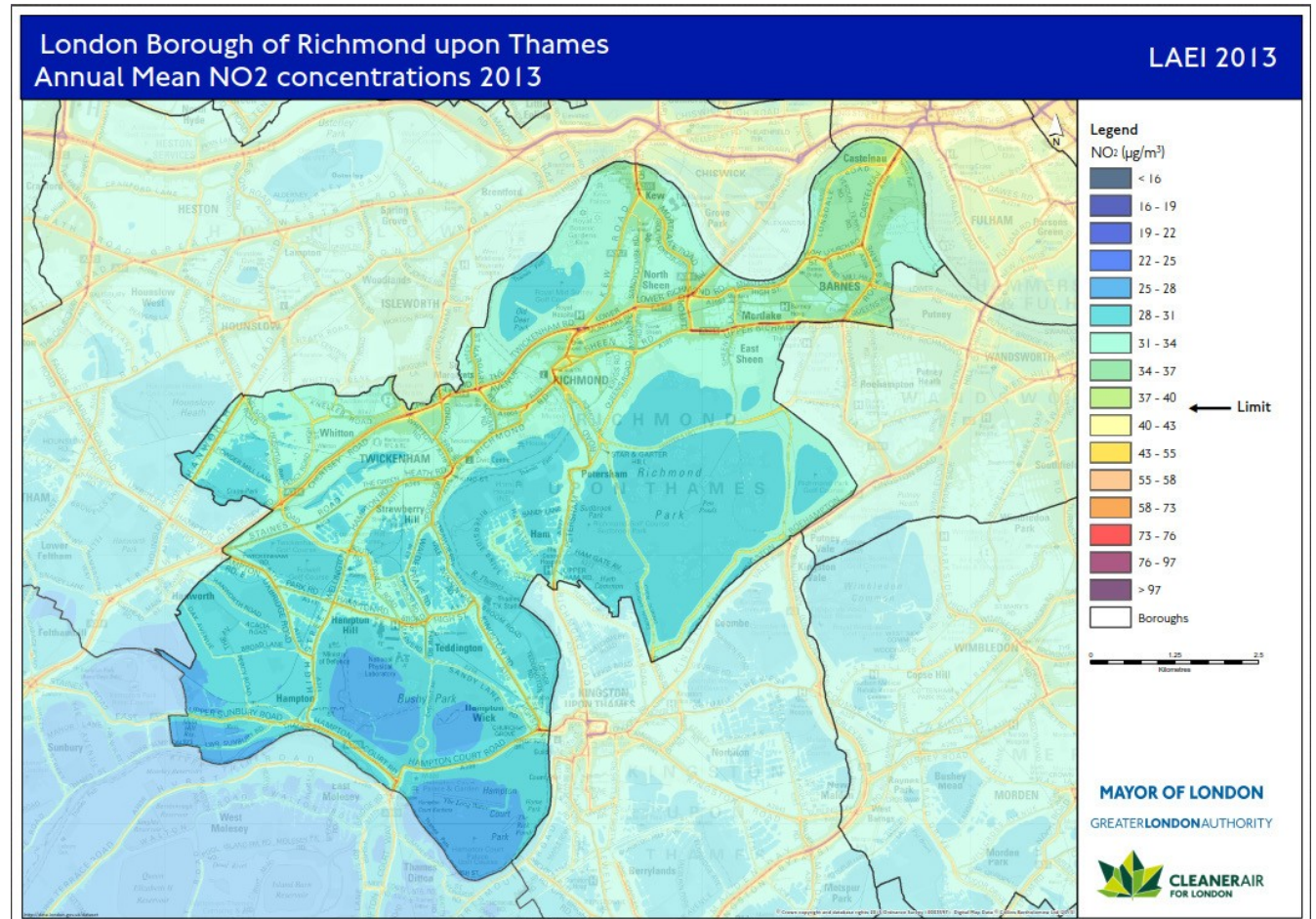


Figure 1: Modelled map of annual mean NO<sub>2</sub> concentrations (from the LAEI 2013)

Exceedance of the PM<sub>10</sub> annual mean objective also extends along the main transport links. The main areas of concern are the A316 where it passes through Richmond town centre and North Sheen, King Street, Twickenham, Hampton Wick near Kingston Bridge, and A306 at Castelnau.

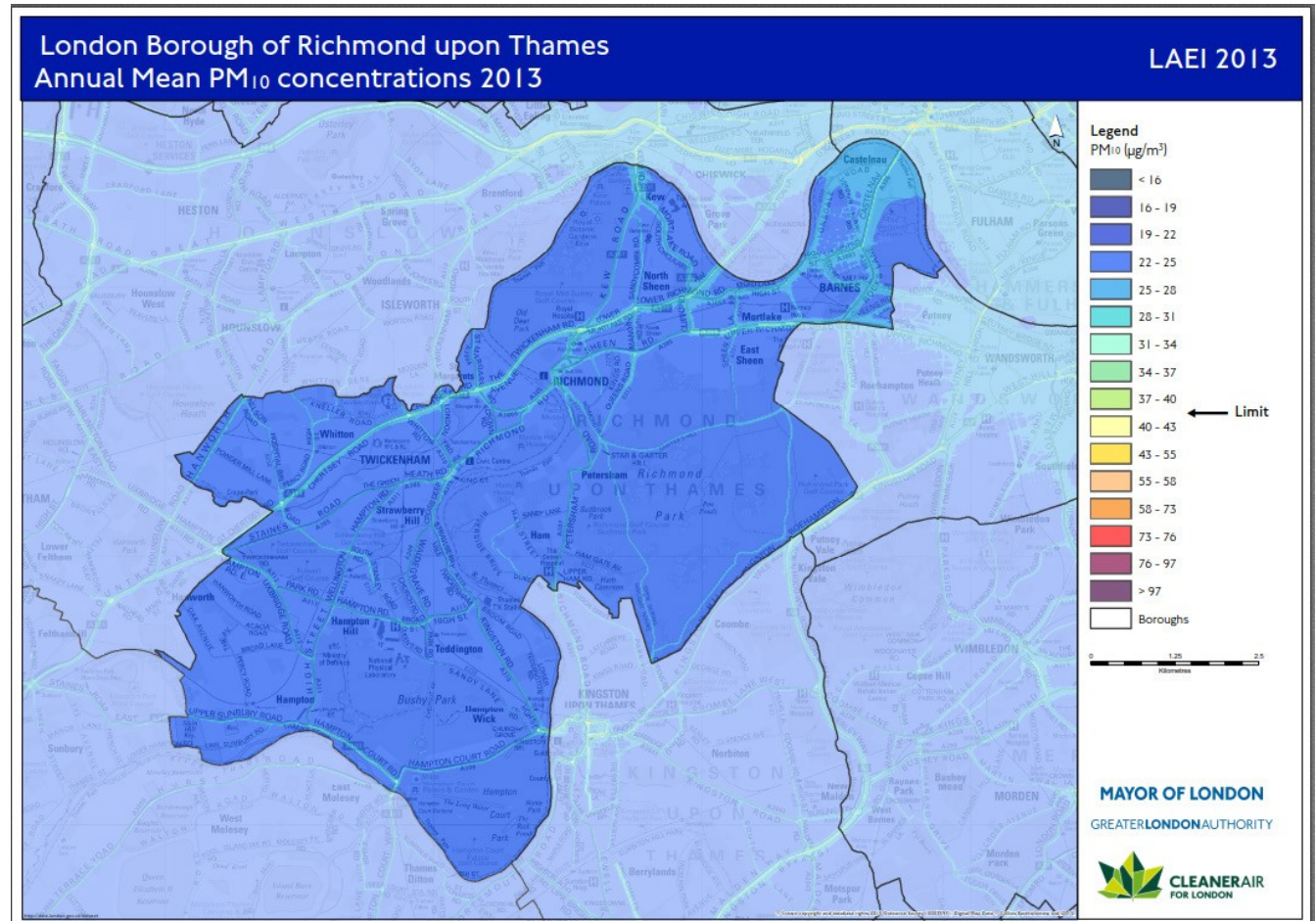


Figure 2: Modelled map of annual mean PM<sub>10</sub> (from the LAEI 2013)

PM<sub>2.5</sub> concentrations are not currently monitored in Richmond but the dispersion model identifies elevated concentrations along the main transit routes and in the town centres within the borough, as would be expected. There is no regulatory standard applicable to English local authorities in respect of PM<sub>2.5</sub>, however, the EU Ambient Air Quality Directive (2008/50/EC) does set out air quality standards including an exposure reduction obligation, a target value and a limit value (25µg/m<sup>3</sup> by 2020). The GLA has introduced a 'PM<sub>2.5</sub> borough role' for air quality teams to consider how existing and new priority actions can help reduce PM<sub>2.5</sub> levels in their area, and to work collaboratively to align any new measures with the objectives of the borough Public Health team.

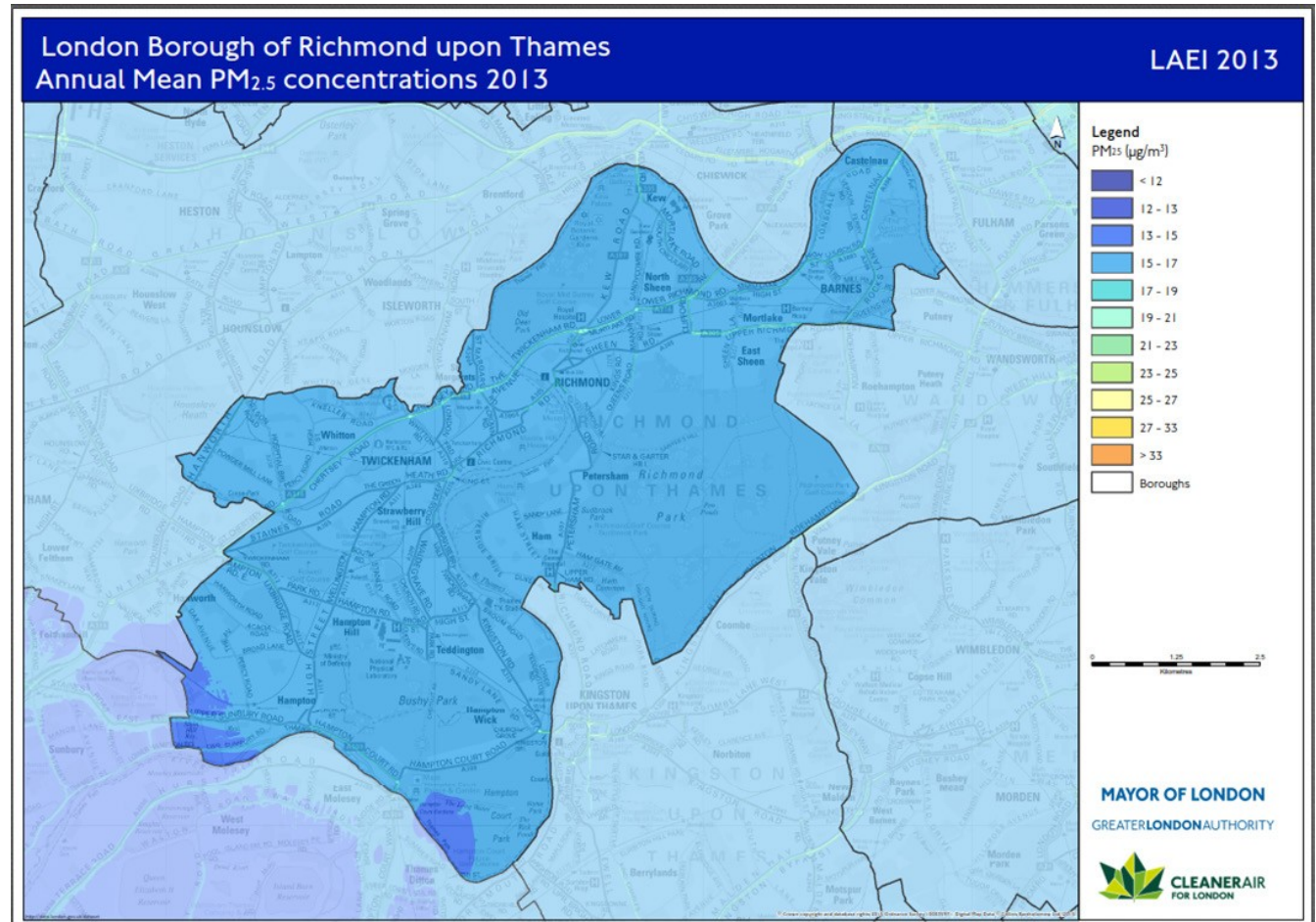


Figure 3: Modelled map of annual mean PM<sub>2.5</sub> (from the LAEI 2013)

## Public Health Outcomes Framework

The current Public Health Outcomes Framework (PHOF), produced by Public Health England, provides an indication of differences in life expectancy and healthy life expectancy between communities. The fraction of mortality attributable to particulate air pollution (Indicator 3.01) for Richmond upon Thames is as follows:

Region/community	Particulate air pollution (Indicator 3.01) (Feb 2017)
London Borough of Richmond upon Thames	5.1
London Region	5.6
England	4.7

Source: Public Health Outcomes Framework – Public Health England (website accessed May 2017)

The PHOF data indicates that the fraction of mortality attributable to particulate air pollution is slightly below the average value for the London region but is higher than the average for England.

## Estimate of Population Exceeding UK Annual Mean Objective for NO<sub>2</sub>

Data from the London Atmospheric Emissions Inventory also provides an estimate of proportion of the total population of Richmond that are subject to NO<sub>2</sub> concentrations in excess of the annual mean UK AQ objective of 40µg/m<sup>3</sup>. Based on modelled data for 2013 this was slightly in excess of 13%. The table below provides a comparison of this statistic against other boroughs in the South London Sub-Region and indicates that Richmond has the second highest population exposed to NO<sub>2</sub> in excess of the objective.

Borough	% Population in borough > 40µg/m <sup>3</sup> (LAEI 2013)
Wandsworth	20.12
Richmond upon Thames	13.06
Kingston	7.48
Bromley	5.80
Croydon	3.83
Sutton	3.77
Merton	0.55

Nitrogen Dioxide (NO<sub>2</sub>) concentrations remain in excess of the UK Air Quality Objectives at a significant number of locations across the borough. Monitoring during 2016 indicated that the annual mean NO<sub>2</sub> objective of 40µg/m<sup>3</sup> was exceeded at 48 of the 64 sites where monitoring was carried

out with the highest concentrations measured at sites in Richmond, Twickenham, Barnes, Chalkers Corner, Hampton, East Sheen, Hampton Hill, Kew, Teddington, Whitton, Hampton Wick and St. Margaret's. Additionally, at five of these monitoring sites measured NO<sub>2</sub> concentrations were in excess of 60µg/m<sup>3</sup>, which is considered indicative of an exceedance of the 1-hour UK AQ objective. These sites were George Street, Hill Street, The Quadrant and Red Lion Street in Richmond; and York Street in Twickenham. Exceedance of this short term objective indicates that there is a risk to individuals spending as little as an hour in the area of exceedance and is therefore significant not just for people living in that area but also for those working or visiting the area.

Monitoring trends for the period 2010 to 2016 indicate very little change in NO<sub>2</sub> levels across the borough over the past 7 years. Given the consistently high concentrations measured and the extent of the borough failing to meet the UK AQ objectives it is clear that more robust action on a national, regional and local scale is needed to protect the health of those living within the borough.

## Calculation of Required Reduction in Emissions

Local authorities are recommended to identify the reduction in pollutant emissions required to attain the objectives within their AQMAs to determine the scale of effort likely to be required. The London Local Air Quality Management Technical Guidance document (LLAQM.TG16) recommends that this is expressed as the required percentage reduction of local emissions in terms of NO<sub>x</sub> due to local road traffic. This is because the primary emission is of NO<sub>x</sub> and there is a non-linear relationship between NO<sub>x</sub> concentrations and NO<sub>2</sub> concentrations. The calculation was carried out according to Box 4.5 of LLAQM.TG16 and was based on the monitoring site recording the highest measures NO<sub>2</sub> concentration (George Street, Richmond at 96µg/m<sup>3</sup> in 2016)) as this represented the worst case location. The calculation is summarised in the table opposite.

Site	Measured NO <sub>2</sub>	Dist corr.	Total Nox	Background concs		Road Nox-current
				NO <sub>2</sub>	NO <sub>x</sub>	
Richmond Circus	96	80.8	164.39	25.6	39.8	124.59
Road NO <sub>x</sub> to give 40ug/m <sup>3</sup>			33.03			
Road NO <sub>x</sub> reduction	91.56					
% Reduction	73 %					